

## INTRODUCTION

The earth's biogeochemical systems involve complex, dynamic processes that depend upon many factors. The three main factors upon which life on the earth depends are:

1. The one-way flow of solar energy into the earth's systems. As radiant energy, it is used by plants for food production. As heat, it warms the planet and powers the weather system. Eventually, the energy is lost into space in the form of infrared radiation. Most of the energy needed to cycle matter through earth's systems comes from the sun.
2. The cycling of matter. Because there are only finite amounts of nutrients available on the earth, they must be recycled in order to ensure the continued existence of living organisms.
3. The force of gravity. This allows the earth to maintain the atmosphere encompassing its surface and provides the driving force for the downward movement of materials in processes involving the cycling of matter.

These factors are critical components to the functioning of the earth's systems, and their functions are necessarily interconnected. The main matter-cycling systems involve important nutrients such as water, carbon, nitrogen and phosphorus.

The image below is an infrared photograph of giant sequoia. White areas show maximum reflection of infrared radiation.

